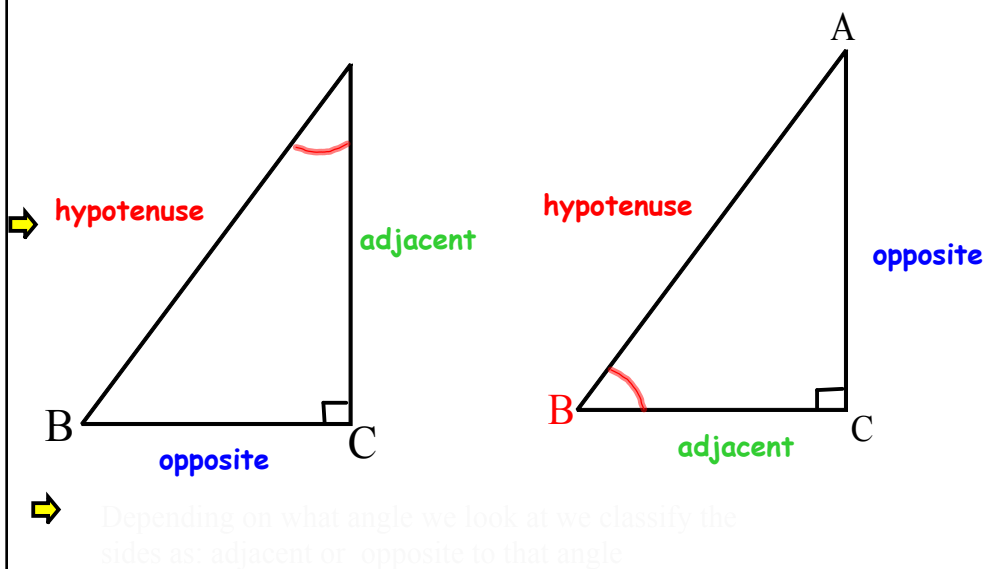


## 4.1 Primary Trigonometric Ratios



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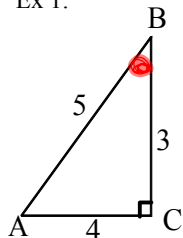
$$\sin A = \frac{\text{opp}}{\text{hyp}}$$

$$\cos A = \frac{\text{adj}}{\text{hyp}}$$

$$\tan A = \frac{\text{opp}}{\text{adj}}$$

# SOH CAH TOA

Ex 1:



Angle A

$$\sin A = \frac{3}{5}$$

$$\cos A = \frac{4}{5}$$

$$\tan A = \frac{3}{4}$$

Angle B

$$\sin B = \frac{4}{5}$$

$$\cos B = \frac{3}{5}$$

$$\tan B = \frac{4}{3}$$

Angle C

$$\sin C$$

$$\cos C$$

$$\tan C$$

Primary trig ratios

Sin and Cos

Tan

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Ex 2:

SOH CAH TOA

a) Use your calculator to find the ratio

$$\sin 45^\circ = 0.707 \quad \cos 78^\circ = 0.2079 \quad \tan 32^\circ = 0.624$$

b) Use your calculator to find the angle:

$$\sin A = 0.9511 \quad \cos B = -0.2079 \quad \tan C = 0.2679$$

$$\sin^{-1}(\sin A) = \sin^{-1}(0.9511) \quad \cos^{-1}(-0.2079) \quad \tan^{-1}(0.2679)$$

$$A = 72^\circ \quad B = 102^\circ \quad C = 15^\circ$$

Ex 3: Find a side

a)

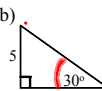


$$10 \cdot \cos 45^\circ = \frac{x}{10}$$

$$x = 10 \cos 45^\circ$$

$$x \approx 7.1$$

b)



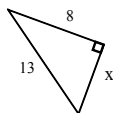
$$\tan 30^\circ = \frac{5}{x}$$

$$\sin 30^\circ = \frac{1}{2} = \frac{x}{10}$$

$$x = \frac{5}{\tan 30^\circ}$$

$$x \approx 8.7$$

c)



$$c^2 = a^2 + b^2$$

$$13^2 = 8^2 + b^2$$

$$169 = 64 + b^2$$

$$169 - 64 = b^2$$

$$\sqrt{b^2} = \sqrt{105}$$

$$b \approx 10.2$$

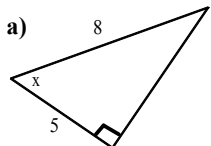
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Ex 4: Find an angle

$$\cos X = \frac{5}{8}$$

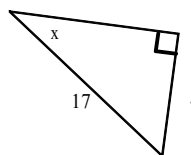
$$X = \cos^{-1}\left(\frac{5}{8}\right)$$

$$\sin X = \frac{7}{17}$$



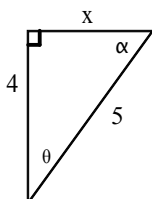
$$X \approx 51.3^\circ$$

b)



$$X \approx 24.3^\circ$$

Ex 5: Find all missing sides and angles



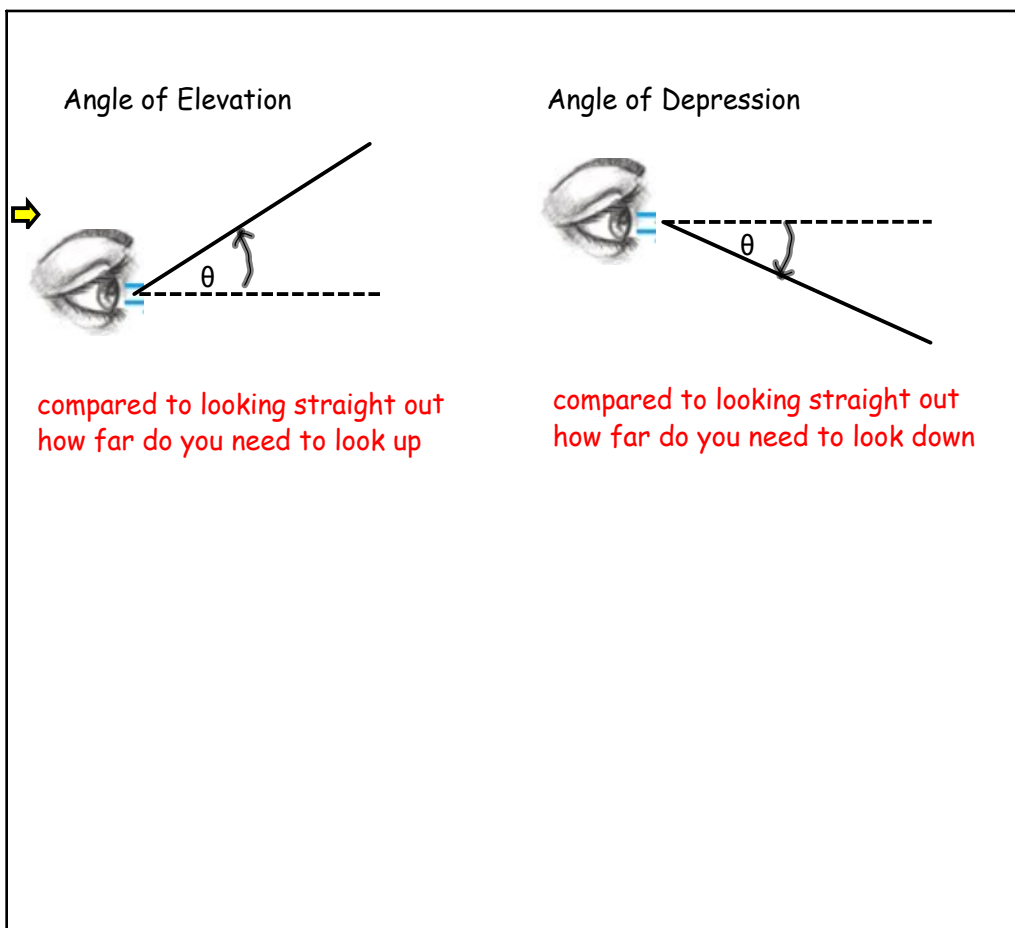
$$x = 3$$

$$\alpha \approx 53^\circ$$

$$\theta \approx 37^\circ$$

$$\sin \alpha = \frac{4}{5}$$

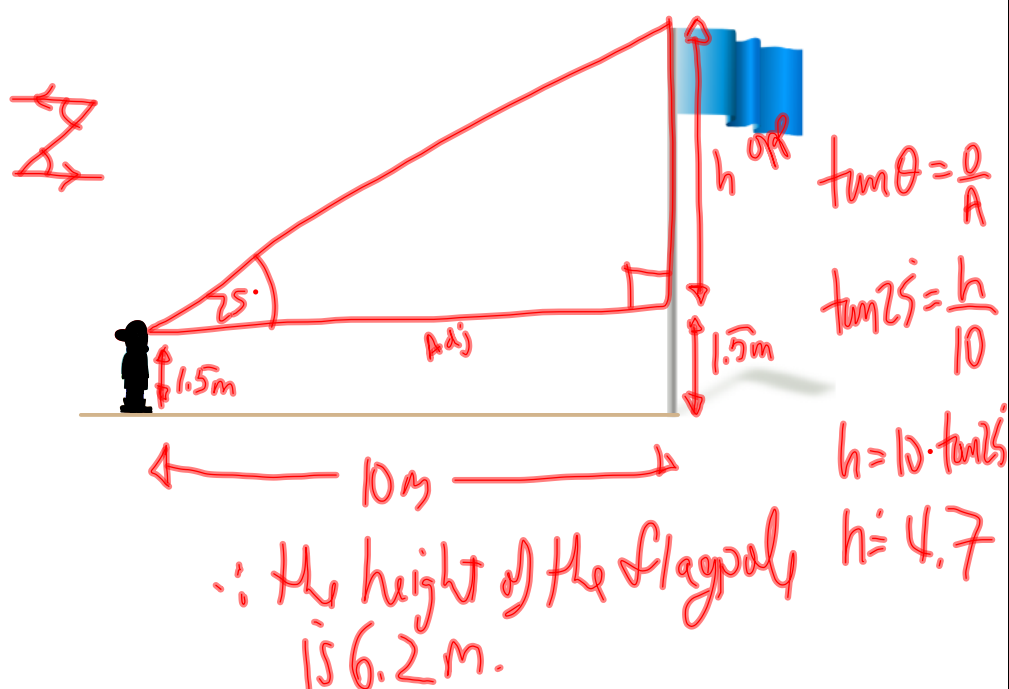
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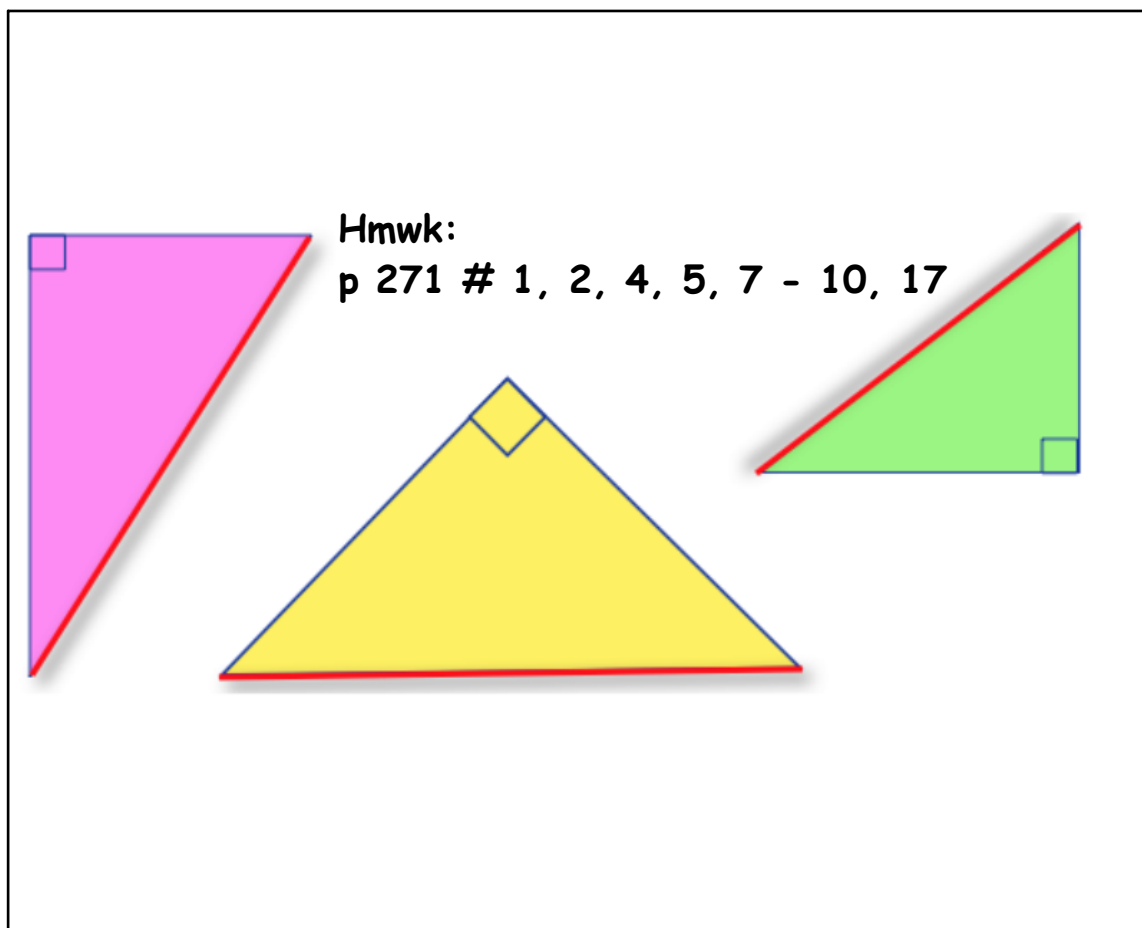
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Ex 5:

Dave is standing 10 m away from a flagpole. His eyes are 1.5 m above the ground. The top of the flagpole has an angle of elevation of  $25^\circ$ . How tall is the flagpole?



Oct 26-4:37 PM



Oct 26-4:45 PM